

REMARKS

I. Status of the Claims

Claims 1, 4, 5 and 10-24 are rejected. Claims 2, 3, 6, 7, and 9 were previously canceled. Without prejudice or disclaimer, claims 5 and 16 have been canceled and claim 1 has been amended. Upon entry of this amendment, claims 1, 4, 8, 10-15 and 17-24 are pending.

Claim 1 has been amended to incorporate the elements of claim 5, and now recites, *inter alia*, "wherein said high density comprises a blend of at least two polyethylenes selected from: (A) a polyethylene having an Mv ranging from about 1500000 to about 5000000; (B) a polyethylene having an Mv ranging from about 600000 to about 1500000; and (C) a polyethylene having an Mv from about 250000 to about 600000, and...." Support for this amendment may be found in the published specification and as-filed claims. See, for example, paragraphs [0033] to [0034] of the specification and original claim 5. Applicants submit that the above amendment has full support under 35 U.S.C. § 112 and raises no issue of new matter.

Applicants acknowledge with appreciation the Office's withdrawal of the previously applied 35 U.S.C. § 102(b) rejection. Office Action at p. 5. Applicants respectfully submit that all of the pending claims are allowable for the reasons of record and for the following additional reasons.

II. Entry of Amendment After Final

Applicants respectfully request that this Amendment under 37 C.F.R. § 1.116 be entered by the Office because claims 1, 4, 8, 10-15 and 17-24 are in condition for allowance. Applicants submit that the amendment to claim 1 does not raise new issues

or necessitate the undertaking of any additional search of art by the Office, because all of the elements and their relationships were either earlier claimed or inherent in the claims as examined. Therefore, this amendment should allow for immediate action by the Office.

Furthermore, Applicants respectfully point out that the final action by the Office presented some new arguments as to the application of the art against Applicants' invention. It is respectfully submitted that entering this amendment would allow the Applicants to fully reply to the final rejection and place the application in condition for allowance.

Finally, Applicants submit that the entry of this amendment would place the application in better form for appeal, should the Office dispute the patentability of the pending claims.

III. Rejection under 35 U.S.C. § 103(a)

The Office continues to reject claims 1, 4, 5 and 10-24 as being obvious over U.S. Patent No. 6,245,272 ("Takita") and the Concise Encyclopedia of Polymer Science and Engineering ("Encyclopedia"). *Office Action* at pp. 2-7. The Office alleges that Takita teaches "workable" ranges of molecular weights and related properties, which can be routinely optimized by one of skill in the art because Takita teaches a product for the same end use. *Id.* at p. 6. The Office further alleges that "since the Encyclopedia teaches a HDPE is a polymer of ethylene copolymerized with propylene (α -olefin) for a controlled density and properties, the comonomer is clearly taught as result effective in modifying HDPE properties." *Id.* (emphasis added). In addition, the Office contends that the Declaration under 37 C.F.R. § 1.132 submitted by Masahiro Ohashi with

Applicants' last response provides results that appear to confirm an optimization of Takita's invention. *Id* at p. 7.

This rejection is moot with respect to claims 9 and 15, which are now canceled. In response to the currently pending claims, Applicants disagree with and traverse this rejection.

The standards for an obviousness analysis are set forth in *Graham v. John Deere*, 383 U.S. 1, 148 U.S.P.Q. 459 (1996). The four factual inquiries established by the Court in *Graham* are as follows:

- (A) Determining the scope and content of the prior art;
- (B) Ascertaining the differences between the prior art and the claims in issue;
- (C) Resolving the level of ordinary skill in the pertinent art; and
- (D) Evaluating evidence of secondary considerations.

After resolving the four inquiries, the key to supporting any rejection under § 103 is the clear articulation of the reason(s) why the claimed invention would have been obvious. The Supreme Court instructs that "[t]o facilitate review, this analysis [of whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue] should be made explicit." *KSR Int'l Co. v. Teleflex Inc.*, *et al.*, 127 S. Ct. 1727, 1741, 82 U.S.P.Q.2d 1385, 1396 (2007) (citing *In re Kahn*, 441 F.3d 977, 988, 78 U.S.P.Q.2d 1329, 1336 (Fed. Cir. 2006) ("[R]jections on obviousness grounds cannot be sustained by mere conclusory statements; instead there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.")); *see also* M.P.E.P. § 2141(III).

Furthermore, "[t]he mere fact that references can be combined or modified does not render the resultant combination obvious unless the results would have been predictable to one of ordinary skill in the art" at the time the invention was made. M.P.E.P. §2143.01(III) (emphasis in original, citation omitted). Moreover, "[i]n determining the differences between the prior art and the claims, the question under 35 U.S.C. 103 is not whether the differences themselves would have been obvious, but whether the claimed invention as a whole would have been obvious." M.P.E.P. § 2141.02(I) (emphasis in original, citations omitted).

With respect to the § 103(a) analysis of chemical compounds, the requirement of motivation has been even further clarified by the Federal Circuit in *Takeda Chemical Industries v. Alphapharm Pty., Ltd.*, 492 F. 3d. 1350 (Fed. Cir. 2007). In *Takeda*, the court held that **mere structural similarity** between a claimed compound and that of the prior art **is not enough** to establish that a claimed compound is *prima facie* obvious. See *Id.* at p. 1357. Rather the prior art must provide "reason or motivation to make the claimed compound..." before a *prima facie* case of obviousness can be established. *Id.* (quoting *In re Dillon*, 919 F. 2d 688, 692 (Fed. Cir 1990) (emphasis added)). The court stated that "it remains necessary to **identify some reason** that would have led a chemist to modify a known compound in a **particular manner** to establish *prima facie* obviousness of a new claimed compound." *Id.* (emphasis added).

The combination of references relied upon by the Office fails to meet these burdens on the Office. For example, the Office has failed to explain or provide any evidence why one of ordinary skill in the art would be motivated to substitute the

polymers disclosed in Takita's blend with the claimed polymers to arrive at the claimed microporous polyethylene film with any reasonable expectation of success.

Claim 1 as presently amended recites:

A microporous polyethylene film having a film rupture temperature of 150 °C or higher and a fusing rupture temperature of 140 °C or lower comprising a blend that comprises:

- a high density polyethylene copolymer which has a melt index (MI) of 0.1 to 100, and a content of an α -olefin unit with 3 or more carbon atoms of 0.1 to 1% by mole;
- a high density polyethylene which has a viscosity average molecular weight (Mv) of at least 500000 to 5000000;

wherein said high density polyethylene comprises a blend of at least two polyethylenes selected from:

- (A) a polyethylene having an Mv ranging from about 1500000 to about 5000000;
- (B) a polyethylene having an Mv ranging from about 600000 to about 1500000; and
- (C) a polyethylene having an Mv from about 250000 to about 600000, and

wherein the microporous polyethylene film blend has an Mv of 300000 to 4000000, a content of an α -olefin unit with 3 or more carbon atoms of 0.01 to 1% by mole, and contains about 10 to about 90% of high density polyethylene copolymer.

Takita does not teach or suggest a film blend comprising, *inter alia*, a high density polyethylene comprised of at least two polyethylenes as claimed. Takita discloses a **single** ultrahigh molecular weight polymer (UHMWPE) and **single** high density polyethylene (HDPE) as a microporous polyolefin membrane blend. *Takita* at col. 2, lines 41-67 and Table 1. Takita admittedly fails to further teach or suggest the recited α -olefin content of the copolymer, the melt index, the viscosity average molecular weight, the blend molecular weight, the total α -olefin content and the percentage of copolymer. Takita alone provides no reason why one of ordinary skill in the art would: 1) select the claimed α -olefin comonomer content of an HDPE copolymer; 2) select a particular melt index; 3) choose a specific average molecular weight viscosity range; 4) vary the molecular weight of the blend; 5) select the percentage of copolymer; and 6) combine at least two polyethylenes having specific molecular weights to form a blend of an HDPE having the recited viscosity average molecular weight¹.

The Encyclopedia fails to cure these deficiencies. The Encyclopedia provides at best a general statement that HDPE copolymers always contain a small number of branches that are introduced by copolymerization of ethylene with α -olefins. Among its many failings, the Encyclopedia provides absolutely no reason to the skilled artisan why he/she would replace the UHMWPE of Takita with a copolymer and/or why he/she

¹ The Office openly admits that Takita is silent with respect to the recited α -olefin content of a HDPE copolymer, the melt index, the viscosity average molecular weight, the molecular weight of the blend, the total α -olefin content and percentage of copolymer. Despite this admission, the Office continues to assert that the claimed invention is obvious.

would replace the HDPE with an HDPE blend as claimed. Nor does the Encyclopedia provide any reasons why one skilled in the art would select the claimed copolymer or claimed HDPE blend. Finally, assuming, *arguendo*, that the claimed film blend could even be gleaned from the combined teachings of the art, there would be no expectation of success with the required substitutions to Takita.

The Office fails to explain why replacing the UHMWPE and HDPE of Takita with completely different polymers (i.e., the claimed HDPE blend and copolymer), with different physical properties and characteristics, would lead to predictable results, let alone successful results. *KSR International Co. v. Teleflex Inc.*, 127 S. Ct. 1727 (2007). The wholesale substitution of Takita's polymers with those claimed is instructed only by improper hindsight. The use of hindsight reasoning is not a proper route to establishing a prima facie case of obviousness. See M.P.E.P. § 2141(II) (citing *Hodosh v. Block Drug Co., Inc.*, 786 F.2d 1136, 1143 (Fed. Cir. 1986)). In the field of polymers, there are an infinite number of possible polymer combinations and potentially endless products, with an infinite number of properties. Suggesting a random substitution of one polymer for another, as was the case here, without any reason or motivation, and lacking any predictable result, is improper and contrary to established law. *KSR International Co. v. Teleflex Inc.*, 127 S. Ct. 1727 (2007).

In addition, the Encyclopedia provides no insight or guidance as to how or why a specific α -olefin range, a specific melt index, a specific average molecular weight viscosity range, a specific percentage of an HDPE copolymer in a blend, and/or a blend of HDPE comprising at least two molecular weight specific polyethylenes would be useful to obtain certain overall properties, much less the properties as claimed. There is nothing in the Encyclopedia that would point to or motivate the skilled artisan to vary a particular variable, **much less 7 variables**, and recognize that the results would have been predictable. *Id.*

Applicants respectfully submit that the Office's assertions are mere conjecture unsupported by evidence. The Court of Appeals for the Federal Circuit ("CAFC") has clearly explained that while the USPTO examiners may rely upon what is generally known in the art, they must provide evidentiary proof of that knowledge. *See In re Zurko*, 59 U.S.P.Q.2d 1693, 1697 (Fed. Cir. 2001) ("With respect to core factual findings in a determination of patentability, however, the Board cannot simply reach conclusions based on its own understanding or expertise . . . Rather, the Board must point to some concrete evidence in the record in support of these findings.") (emphasis added). Applicants respectfully submit that the Office has not pointed to any evidence to support the assertion that one skilled in the art would have found it obvious to modify the cited references in an attempt to arrive at the claimed invention.

For all of the above reasons, the Office has failed to establish a *prima facie* case of obviousness.

IV. Conclusion

In view of the foregoing, Applicants request entry of this amendment, the Office's reconsideration and reexamination of the application, and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to Deposit Account No. 06-0916.

Respectfully submitted,

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